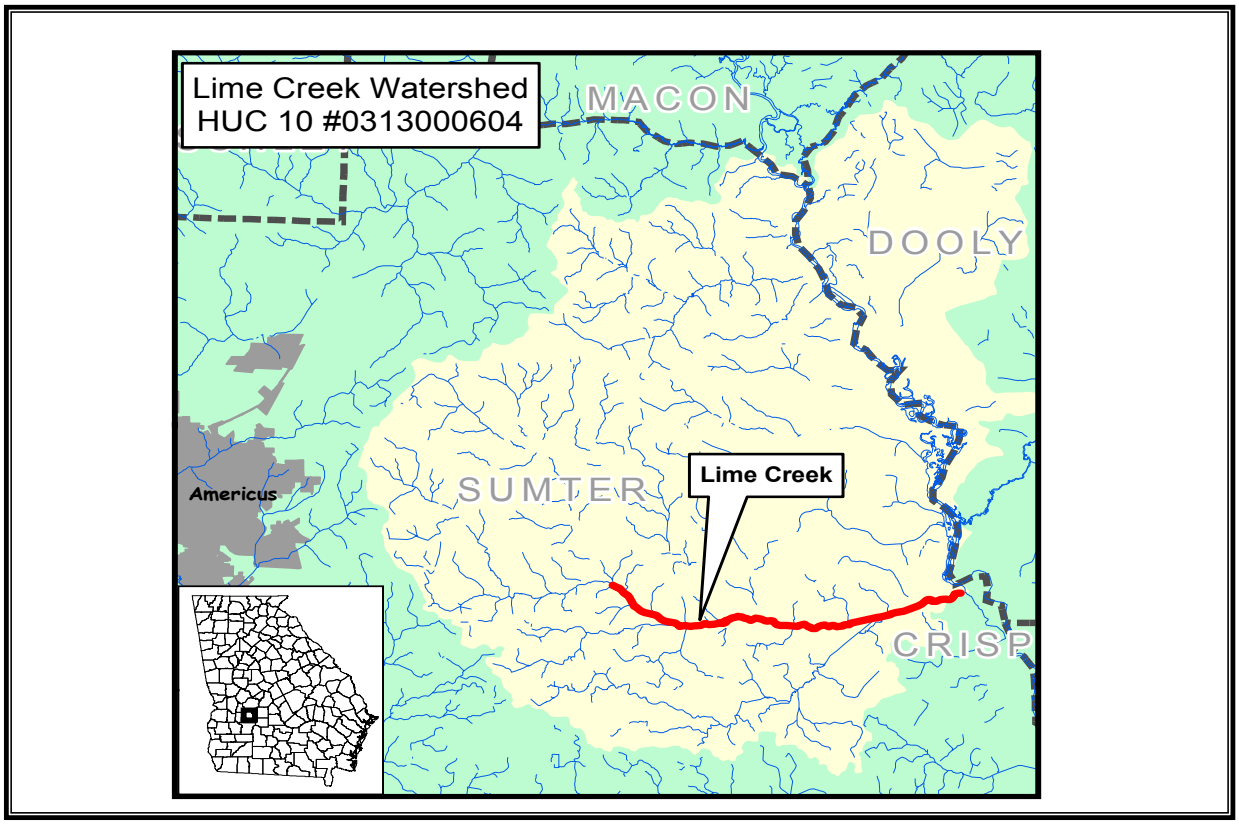
STATE OF GEORGIA

TMDL IMPLEMENTATION PLAN

LIME CREEK
(Fecal Coliform)

Prepared by
The Georgia Department of Natural Resources
Environmental Protection Division
Atlanta, GA

TMDL Implementation Plans are platforms for establishing a course of actions to restore the quality of impaired water bodies in a watershed. They are intended as a continuing process that may be revised as new conditions and information warrant. Procedures will be developed to track and evaluate the implementation of the management practices and activities identified in the plans. Once restored, appropriate management practices and activities will be continued to maintain the water bodies. The overall goal of the Plan is to define a set of actions that will help achieve water quality standards in the state of Georgia. This plan was originally prepared as an implementation inventory by the Middle Flint RDC with a Section 604(b) Grant. TMDL load allocation information has been updated to reflect the approved TMDL.



Impaired Waterbody*	Impaired Stream Location	River Basin	Miles/Area Impacted	Partially Supporting/ Not Supporting
Lime Creek	Little Lime Creek to Lake Blackshear	Flint	5	Partially Supporting

STATE OF GEORGIA

TMDL IMPLEMENTATION PLAN FOR: LIME CREEK (STREAM) FECAL COLIFORM (PARAMETER) RIVER BASIN: FLINT RIVER PLAN DATE: 12/10/01

Prepared by: Gerald Mixon Middle Flint Regional Development Center Address: 228 West Lamar Street City: Americus State: GA Zip: 31709 e-mail: gmixon@sowega.net Date Submitted to EPD: 12/10/01	Or Prepared By: Address: City: State: Zip: e-mail: Date Submitted to EPD:

General Information

Obtain this information from the TMDL document or other information. When completed, this document will be a self-contained report independent of the TMDL document.

Significant Stakeholders

Identify local governments, agricultural organizations or significant land holders, commercial forestry organizations, businesses and industries, and local organizations including environmental groups with a major interest in this water body.

Additional Stakeholders identified on page 7.

TMDL ID (to be entered by EPD)	FLT0000015
Water body name	Lime Creek
HUC basin name	Middle Flint
HUC number	031300060407
Primary county	Sumter
Secondary county	
Primary RDC	Middle Flint
Secondary RDC	
Water body location	Lake Blackshear
	(Sumter County)
Miles or area impacted	5 miles
Parameter addressed in plan	Fecal Coliform
Water use classification	Fishing
Degree of impairment	Partially supporting use
	Not supporting use X
Date TMDL approved by EPD	February 2003
Impairment due to	Point sources
	Nonpoint sources X
	Both

Point source-Form A; Nonpoint source-Form B; Both-Form A+B+C

Name/Organization	Sumter County Board of Commissioners				
Address	P. O. Box 295				
City	Americus	State	GA	Zip	31709
Phone	229-928-4501			e-mail	
Name/Organization	Sumter County Extension Service				
Address	P. O. Box 1027				
City	Americus	State	GA	Zip	31709
Phone	229-924-4476			e-mail	
Name/Organization	Sumter County Health Department				
Address	208 Rucker Street				
City	Americus	State	GA	Zip	31709
Phone	229-924-3637			e-mail	
Name/Organization	Sumter County Farm Bureau				
Address	P. O. Box 1104				
City	Americus	State	GA	Zip	31709
Phone	229-924-0339			e-mail	
Name/Organization	Sumter County Forestry Unit				
Address	178 Bumphead Road				
City	Americus	State	GA	Zip	31709
Phone	229-931-2511			e-mail	

SUMMARY OF ALLOCATION MODEL RESULTS FROM TMDL DOCUMENT (existing load, target TMDL, and needed reduction)

EXISTING LOAD	TARGET TMDL	NEEDED REDUCTION
1.15E+12 (counts/30days)	9.72E+11 (counts/30days)	15%

I. IDENTIFY **NONPOINT SOURCE** CATEGORIES AND SUBCATEGORIES OR INDIVIDUAL SOURCES WHICH MUST BE CONTROLLED TO IMPLEMENT LOAD ALLOCATIONS:

List major nonpoint sources contributing to impairment including those identified in TMDL document.

SOURCE	DESCRIPTION OF CONTRIBUTION TO IMPAIRMENT	RECOMMENDED LOAD REDUCTION (FROM TMDL)
Agriculture	Concentrated Animal Feedlot Operations	Not specific to this source
Agriculture	Small herd cattle farms	Not specific to this source
On-site sewage management systems	Septic tanks in subdivision	Not specific to this source
Wildlife	Habitat adjacent to creek	Not specific to this source

II. DESCRIBE ANY REGULATORY OR VOLUNTARY ACTIONS INCLUDING MANAGEMENT MEASURES OR OTHER CONTROLS BY GOVERNMENTS OR INDIVIDUALS THAT WILL HELP ACHIEVE THE LOAD ALLOCATIONS IN THE TMDL:

Existing or required regulatory actions

RESPONSIBLE GOVERNMENT, ORGANIZATION OR ENTITY	**NAME OF REGULATION/ORDINANCE**	DESCRIPTION	ENACTED OR PROJECTED DATE (mm/yy)	STATUS
Sumter County Health Dept.	State rules and regs. for on-site sewage mgt. sys.	Regulates installation of septic tanks	01-98	active
GA EPD	Concentrated Animal Feedlot Operations	Enforcement of wastewater treatment regulations applicable to feedlots	09-74	Enforced as needed

Existing voluntary actions

RESPONSIBLE ORGANIZATION OR ENTITY	NAME OF ACTION	DESCRIPTION	ENACTED OR PROJECTED DATE (mm/yy)	STATUS
Ag producers	Best Management Practices	Maximizing production without causing deleterious effects on other resources	1990s	Active
Soil and Water Conservation District	Promote voluntary adoption of agricultural best management practices	Provide leadership in protection, conservation, and improvement of soil, water and related resources	1937	Active
USDA Natural Resources Conservation Service (NRCS)	Environmental Quality Incentives Program and other technical assistance	Develop standards and specifications regarding conservation practices, animal waste management systems, grazing, et. al. – implements state priorities	1997	Needs funding
University of Georgia Cooperative Extension Service and Experiment Stations	Disseminate information	Consultative assistance, information on nonpoint-related impacts on water quality, water quality monitoring, analysis of nutrients and other constituents in animal waste, nutrient management plans	1914	Active
Farm Services Agency (FSA)	Water quality improvement practices (conservation Reserve Program)	Administration of cost-sharing and incentive programs for practices that improve environmental quality of farms. Funds targeted for high-priority watersheds with water quality problems.	1985	Active
Georgia Department of Agriculture	Disease control	Provides guidance in location of animal waste facilities and disposal of dead animals.	1874	As needed
USDA Agricultural Research Service (ARS)	Agriculture research and monitoring	Research on grazing-land systems and irrigation methods relevant to watershed-scale monitoring projects and nutrient movement in surface water and groundwater		As needed
Resource Conservation and Development Council	Volunteer activism	Citizen activism in conservation of natural resources	1962	As needed
Landowners	Wild game hunting	Hunting for recreation	1800s	Active

Additional recommended regulatory or other measures which should be implemented to reduce the loads of the TMDL parameter

ENTITY/ORGANIZATION RESPONSIBLE	NAME OF PROPOSED REGULATION/ORDINANCE/ OTHER	DESCRIPTION	ENACTED OR PROJECTED DATE (mm/yy)	STATUS
County Extension	Agriculture BMP survey	Survey current agriculture practices to identify possible weaknesses in BMP implementation	Years 2-3	Pending plan approval and funding
Health Department	Septic systems survey	Survey residential subdivisions for possible malfunctioning septic systems	Years 2-3	Pending plan approval and funding
GA. DNR – Game and Fish Division	Hunter education	Educate hunters of the environmental harm of disposing wild game entrails in waterways	Years 1-5	Pending plan approval and funding

III. SCHEDULE FOR IMPLEMENTING MANAGEMENT MEASURES OR OTHER CONTROL ACTIONS:

These **must be implemented within five years** of when the implementation plan is accepted by EPD.

IMPLEMENTATION ACTION	**YEAR 1**	**YEAR 2**	**YEAR 3**	**YEAR 4**	**YEAR 5**
Form stakeholders group	X				
Organize implementation work with stakeholders and local officials to identify remedial measures and potential funding sources	X	X			
Identify sources of TMDL parameter	X	X			
Develop management programs to control runoff including identification and implementation of BMPs (Phase I): Agriculture		X	X		
Forestry					
Urban					
Mining					
Organize and implement education and outreach programs	X	X*			

Detect and eliminate illicit discharges	X	X*			
Evaluate additional management controls needed		X	X		
Monitor and evaluate results		X	X		
Reassess TMDL allocations		X	X		
Provide periodic status reports on implementation of remedial activities		X	X	X*	X*
If needed, begin process for Phase II (next 5 years) and subsequent phases					X*

- as needed

IV. PROJECTED ATTAINMENT DATE AND BASIS FOR THAT PROJECTION:

The projected attainment date is 10 years from acceptance of the implementation plan by EPD.

V. MEASURABLE MILESTONES:

- Number of management controls and activities already implemented ___11_____

- Number of management controls and activities proposed in five-year work program ____3_____

- Number of management controls and activities actually implemented in five-year work period _____(to be completed after 5 years)

- Stream sampled to identify areas of concern See monitoring plan

- Other _____ _____

- Other _____ _____

VI. MONITORING PLAN:

Describe previous or current sampling activities or other surveys to detect sources or to measure effectiveness of management measures or other controls.

ORGANIZATION	TIME FRAME	PARAMETERS	PURPOSE	STATUS
None Known				

Describe any planned or proposed sampling activities or other surveys. (Scheduled EPD sampling can be found in the Basin Planning document.)

ORGANIZATION	TIME FRAME	PARAMETERS	PURPOSE	STATUS
EPD	2000	Fecal Coliform	basin planning	underway
Georgia Southwestern State University	Year 1 (2)	Fecal Coliform	Verify presence of parameter and if necessary perform alternative bacteriological testing to distinguish between possible sources of fecal coliform contamination.	Implementa-tion pending plan approval and funding

VII. CRITERIA TO DETERMINE WHETHER SUBSTANTIAL PROGRESS IS BEING MADE:

- % concentration or load change (monitoring program)
  dependent upon TMDL document

- Categorical change in classification of the stream
  delisting Lime Creek is the goal

- Regulatory controls or activities installed (ordinances, laws)
  monitor programs/activities implemented during the five year program

- Best management practices installed (agricultural, forestry, urban)
  agriculture – as appropriate, survey current practices to identify possible weaknesses on BMP impelmentation

COMMENTS – refer to following text

Additional Stakeholders:

Charles & M. B. Coley
Elizabeth Elder, GSW
Alan Ford
Nancy Ford
Richard Ford
Lloyd Gay, Jr.
Goose Pond Ag, Inc.
Darrell Hampton
Elizabeth Lane
Johnny Lane
Eldridge Mercer
Eldridge Mercer, Sr.
Scotty Palmer, USDA NRCS
John Emory Popwell
Phil Porter, GFC
Providence Plantation Inc.
James M. Sullivan
Weyerhaeuser Company

Lime Creek
Flint River Basin (Lake Blackshear)
Sumter County

Background

As a result of the analysis of grab samples taken from Lime Creek, a five-mile segment of the waterway was placed on the federal 303(d) list suggesting the presence of certain contaminants (fecal coliform) at levels which compromise the safety of the waterway for fishing purposes.

The validity of the data is highly suspect, however. The Flint River Basin Management Plan 1997 includes a statement acknowledging that sampling was not conducted in a manner which would enable a definitive determination of whether state water quality standards have actually been violated.

Accepted procedure calls for at least four samples collected within a thirty-day period at intervals of not less than twenty-four hours. In the geometric mean calculated therefrom, fecal coliform bacteria are not to exceed 200cfu/100ml for the months of May through October, and 1000cfu/100ml during the months of November through April. Any one sample must not exceed 4000cfu/100ml. However, in the absence of data sufficient to generate a monthly geometric mean, EPA directed that a 400cfu/100ml threshold be applied to samples collected during the months May through October.

Lime Creek is located in east-central Sumter County. Approximately 80% of the impaired segment is located in the primary watershed (±12,500 acres; HUC 031300060407) which terminates at Lake Blackshear. The balance of the impaired segment extends into a secondary watershed (±11,500 acres; HUC 031300060405). The apex of the impairment is the discharge site of a ±60 acre millpond, which serves as the mouth of a third, 10,500 acre watershed (HUC 031300060404).

The affected watersheds are sparsely developed. With a heavy concentration of prime farmland the predominant land use is conventional row-crop agriculture. The heavy use of insecticides and pesticides has decreased significantly as farmers have become increasingly adept at managing beneficial insects. Not only does this offer huge financial savings to the farmer; the practice is ecologically sound.

Much of the woodland in the basins are unmanaged hardwood, but increasing amounts of acreage are being converted to managed pine forest. Statewide surveys have revealed a very high compliance rate with forestry best management practices (BMPs). The creek and its tributaries have deep, wooded buffers.

Six poultry houses are split between two sites in the primary watershed. The larger of the two sites is one mile from the impaired segment and the smaller is near a small tributary three miles upstream of the impaired segment. Depressed livestock markets have

reduced the number of beef cattle on the small number of cattle farms located in the watershed, and completely eliminated the few, small hog farms.

Fifty-five residences were distributed throughout the primary watershed at the time of a 1992 land use survey, for an average of 230 acres per residence. Density in the secondary watershed averaged 85 acres for each of the 130 residences. Seventy-five percent of these 130 residences were concentrated in the upstream half of the watershed at least five miles from the impairment.

The watersheds are rich in wildlife. Residents report increasing populations of deer, feral hogs, wild turkey, raccoon, beaver, and otter.

Stakeholder Involvement

Owners of land contiguous to the impaired segment of Lime Creek were identified from courthouse tax records. Local government officials, Farm Bureau officers and agricultural experts from the County Extension Office and Natural Resources and Conservation Service were also identified. After the mailing of twenty personalized invitations and newspaper publication of a meeting notice, fourteen people attended the July 19 meeting.

Participants doubted the accuracy of the water quality findings and questioned the validity of the listing. After a lengthy discussion the group turned its attention to identifying current activities which could possibly contribute to high readings of fecal coliform. During the nearly two-hour meeting participants shared their knowledge of possible sources and suggested possible corrective measures.

Some in attendance reported seeing feral hogs in the vicinity; one reported having trapped 120 hogs in the preceding two years. Little has yet been done to reduce the herd size. With a feral sow capable of producing as many as twenty piglets each year, the herd size could have multiplied many times in recent years. Local conditions are conducive to such population growth.

Feral hogs are adaptable to almost any habitat, but prefer wooded areas close to water. Lacking sweat glands they regulate body temperature by lying in water or mud and cannot survive in hot climates without a plentiful supply of water. Consequently, it is not surprising that areas of heavy hog use have been previously found to harbor higher concentrations of fecal coliform bacteria (Synatzske).

Their ability to thrive on a diet as diverse as fawns and other young animals, reptiles, amphibians, bird eggs, roots, tubers, berries, acorns, fruits, seeds, pines, fungi, leeches, earthworms, centipedes, insects, fiddler crabs, crayfish, grain, succulent grasses, carrion, and vegetables gives them a distinct survival advantage over other species. Because they are so adaptable, tenacious, and have no natural predators, it is difficult to control their population.

If not larger than the livestock population, the feral hog population is at least nearer the creek. This, in conjunction with purported increases in other wildlife, may result in a fecal count in excess of the previously recorded level.

Of the few cattle farms that exist, cattle graze open pasture stocked at levels at or below recommended best management practice (BMP). Because of depressed livestock markets cattle herd sizes have decreased in recent years, and the few (small) hog farms no longer exist. It was reported that in previous years poultry litter was applied to some farmland, especially in the upstream reaches of the basin, but the practice has waned recently. Even so, the poultry industry has initiated the use of nutrient management plans, a BMP which reduces the potential for fecal coliform bacteria to be transported off the farm and into waterways after land application of the dried poultry waste.

Monitoring Plan

The current proposal includes segmented testing, or collecting samples from multiple locations in an attempt to better identify the possible source(s) of the identified paramters. Samples will be collected and processed in compliance with 40 CFR 136. Because validity of the original finding is highly questionable, this plan places heavy emphasis on additional scientific sampling and analyses before other actions are initiated. Funding is critical to the implementation of this monitoring plan.

Monitor Site # 1 is believed to be the original test site, Ga. Highway 195 at Lime Creek. Additional samples are proposed at this site to verify/disprove the presence of fecal coliform at levels which compromise/jeopardize water quality. Based on analysis of updated data, necessary corrective actions will be implemented.

If feral hogs are found to be a primary contributor, DNR officials will be instrumental in plan development and implementation. If deemed appropriate, a detailed inventory of domestic livestock herd sizes will be performed before final plans are made. Feral hog management or removal practices typically include snaring, trapping, shooting, especially at night, and hunting with dogs. There are currently no toxicants or repellents registered for the control of feral hogs.

If analyses are inconclusive, (1) additional testing may be required at a less accessible site upstream, and/or (2) alternative bacteriological sampling may be required to identify the contributing animal species.

Monitor Site # 2 is the apex of the impaired segment and must be accessed from private property. This site is also immediately downstream of a residential subdivision on individual septic tanks.

Monitor Site # 3 is at the intersection of Little Lime Creek and Brickyard Road, immediately downstream of Plum Hill, a manufactured home subdivision where all units are on septic tanks.

Monitor Site # 4 is at the intersection of a small tributary and Ga. Hwy 195, one-half mile south of Ga. 195, immediately downstream of a small poultry farm.

Monitor Site # 5: This site is at the intersection of Lime Creek and Peggy Sheppard Road, immediately downstream of a poultry farm.

If an unsafe fecal count is confirmed at Site # 1, Sites 2 and 3 should be monitored for defective septic tank systems at residential subdivisions immediately upstream. Sites 4 and 5 should be useful in measuring any contributions from domesticated animals (poultry farms) or wildlife. If unsafe levels are recorded at either of these sites, a wildlife survey will be helpful in identifying additional sample sites.

Education

Based on the analysis of updated water samples, and the availability of funding, education efforts will be targeted toward appropriate landowners concerning (1) controlling the feral hog population, and (2) correcting malfunctioning on-site sewage management systems. Game and Fish officers with the Georgia Department of Natural Resources and officials with the county health department, respectively, will be instrumental in these education efforts. In addition, the Middle Flint Regional Development Center will present water resource education programs to the general public.

Potential Funding Sources

Watershed Assistance Grants
Nonpoint Source Implementation Grants (319)
Water Quality Cooperative Agreements
Georgia EPD
Environmental Quality Incentive Program